

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2004-351606

(43)Date of publication of application : 16.12.2004

(51)Int.Cl.

B23B 27/14
B23B 5/46
B23B 27/04
B23B 27/20
// B23C 3/32

(21)Application number : 2003-312265

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(22)Date of filing : 04.09.2003

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(30)Priority

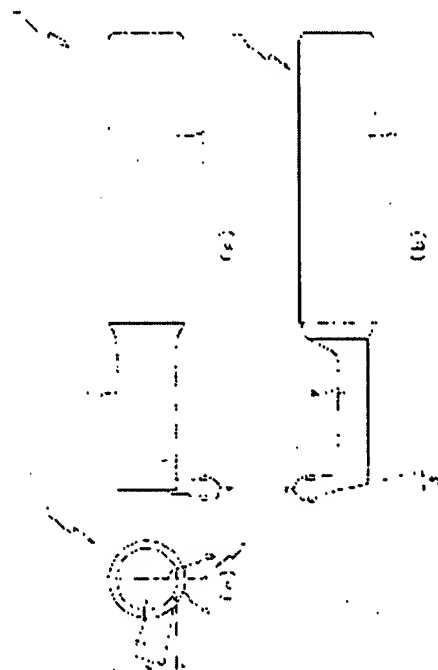
Priority number : 2003129825 Priority date : 08.05.2003 Priority country : JP

(54) NON-ROTARY CUTTING TOOL

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a non-rotary cutting tool that is easily manufactured and used for finishing.

SOLUTION: The rake face and flank of a blade part 4 (an outer peripheral blade 5 and a bottom blade 6) is formed by coating the whole outside surface of tool body 2 with a diamond coating at about 6-20 μ m of thickness by a CVD method and polishing the diamond coating using a grinding wheel so that the roughness of the polished surface is about 1.60 μ mRz. In the non-rotary cutting tool 1, the surfaces of the outer peripheral blade 5 and the bottom blade 6 are coated with a hard diamond coating to secure rigidity, so that the outer peripheral blade 5 and the bottom blade 6 are suppressed from bending during cutting. The diamond coating is polished, thereby improving the roughness of the surface. The non-rotary cutting tool providing sufficient processing accuracy for finishing is easily obtained.



LEGAL STATUS

[Date of request for examination]

07.12.2005

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the
examiner's decision of rejection or application
converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of
rejection]

[Date of requesting appeal against examiner's
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CLAIMS

[Claim(s)]

[Claim 1]

In the nonrotation cutting tool made to carry out cutting advance with the posture in which the field which has a shank, its shank, the body formed successively in one on the same axle, the peripheral cutting edge formed in the side face of the body, and the end cutting edge formed successively by said peripheral cutting edge at the point of said body, and is formed of said peripheral cutting edge and said end cutting edge serves as an abbreviation perpendicular to the sense of a cutting travelling direction,

It is the nonrotation cutting tool characterized by grinding either at least among the diamond coats of the front face of said peripheral cutting edge or said end cutting edge by carrying out coating of the diamond coat at least among the front faces of said peripheral cutting edge or said end cutting edge, as for either.

[Claim 2]

Said nonrotation cutting tool is used for processing of the scrolling type compressor which has the scrolling section set up from a base and its base to an abbreviation perpendicular,

The nonrotation cutting tool according to claim 1 characterized by being that to which said end cutting edge cuts said base while said peripheral cutting edge cuts said scrolling section by carrying out cutting advance of said nonrotation cutting tool.

[Claim 3]

The nonrotation cutting tool according to claim 2 characterized by R of the corner which said peripheral cutting edge and said end cutting edge intersect being 0.05mm or less of abbreviation.

[Claim 4]

A nonrotation cutting tool given in either of claims 1-3 characterized by one of polished surface granularity being 1.60micro below of abbreviation mRz at least among said peripheral cutting edge or said end cutting edge.

[Claim 5]

It is a nonrotation cutting tool given in either of claims 1-4 characterized by R of one of the edge of a blade at least being 0.03mm or less of abbreviation among said peripheral cutting edge or said end cutting edge.

[Claim 6]

The gap from the geometry of the end cutting edge when the gap from the geometric straight line of the peripheral cutting edge when said peripheral cutting edge is based on said shank is 3 micrometers or less and said end cutting edge is based on said shank is a nonrotation cutting tool given in either of claims 1-5 characterized by being 3 micrometers or less.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[Field of the Invention]

[0001]

Especially this invention is easy to manufacture about a nonrotation cutting tool, and it is related with the nonrotation cutting tool which can be used for finish-machining.

[Background of the Invention]

[0002]

A scrolling type compressor is in a kind of the compressor for compressing gas (refrigerant) currently used for the air-conditioner, the refrigerator, etc. A scrolling type compressor carries out the revolution circular motion of the scrolling of a pair relatively, decreases the volume of an actuation room by moving two or more actuation rooms formed of scrolling of these pairs towards a core, and compresses and carries out the regurgitation of the fluids, such as gas led to the actuation interior of a room.

[0003]

A scrolling type compressor is explained using drawing 5 and drawing 6. Drawing 5 (a) is the perspective view of the fixed part 100 fixed to housing (not shown) of a scrolling type compressor, and drawing 5 (b) is a perspective view of moving part 103 inserted in the fixed part 100. A fixed part 100 has the fixed side base 101 and the fixed side scrolling section 102 set up from the fixed side base 101, and is constituted. Moreover, moving part 103 has the approximate circle tabular movable side base 104 and the movable side scrolling section 105 which contacts the fixed side scrolling section 102 and compresses gas, and is constituted. To be shown in drawing 6, said moving part 103 is in the condition inserted in the fixed part 100, and compresses the gas between the movable side scrolling section 105 and the fixed side scrolling section 102 by rotating. The compressed gas is breathed out from the regurgitation port 106 of fixed part 100 center in the exterior of a scrolling type compressor. Therefore, since compression efficiency is so good that whenever [between the movable side scrolling section 105 and the fixed side scrolling section 102 / seal] is high, a high precisor is required of finish-machining of the movable side scrolling section 105 and the fixed side scrolling section 102. Conventionally, processing of the scrolling section of this scrolling type compressor was performed by using an end mill in three processes of roughing, semifinishing, and finishing ** (for example, patent reference.1 reference).

[Patent reference 1] JP,11-336675,A [0018]

[Description of the Invention]

[Problem(s) to be Solved by the Invention]

[0004]

However, when the end mill was used for the finishing process, the deflection by rotation arose in the end mill and holder, and there was a trouble that originated in the deflection and sufficient process tolerance was not acquired. Especially, although whenever [between the scrolling sections / seal] became important in order to raise compression efficiency in a scrolling type compressor, when the process tolerance of the scrolling section was low, whenever [seal] fell, and there was a trouble that the compression efficiency of a scrolling type compressor was hard to be obtained. Moreover, there was a trouble that manufacture of products, such as a scrolling type compressor, became unstable, for example, from it being difficult to obtain the end mill with high process tolerance suitable for finish-machining.

[0005]

It is made in order that this invention may solve the trouble mentioned above, and it aims at offering the nonrotation cutting tool with which process tolerance for finish-machining with easily sufficient manufacture is acquired.

[Means for Solving the Problem]

[0006]

In order to attain this purpose a nonrotation cutting tool according to claim 1 A shank, its shank, and the body formed successively in one on the same axle, It has the peripheral cutting edge formed in the side face of the body, and the end cutting edge formed successively by the point of said body at said peripheral cutting edge. It is the thing made to carry out cutting advance with the posture in which the field formed of said peripheral cutting edge and said end cutting edge serves as an abbreviation perpendicular to the sense of a cutting travelling direction. As for either, coating of the diamond coat is carried out at least among the front faces of said peripheral cutting edge or said end cutting edge, and either at least is ground and constituted among the diamond coats of the front face of said peripheral cutting edge or said end cutting edge.

[0007]

In the nonrotation cutting tool according to claim 1, a nonrotation cutting tool according to claim 2 is used for processing of the scrolling type compressor which has the scrolling section set up from a base and its base to an abbreviation perpendicular, and by carrying out cutting advance of said nonrotation cutting tool, it is constituted so that said end cutting edge may cut said base, while said peripheral cutting edge cuts said scrolling section.

[0008]

In the nonrotation cutting tool according to claim 2, the nonrotation cutting tool according to claim 3 is constituted so that R of the corner which said peripheral cutting edge and said end cutting edge intersect may be 0.05mm or less of abbreviation.

[0009]

The nonrotation cutting tool according to claim 4 is constituted in the nonrotation cutting tool given in either of claims 1-3 that one of polished surface granularity is 1.60micro below of abbreviation mRz at least among said peripheral cutting edge or said end cutting edge.

[0010]

In the nonrotation cutting tool given in either of claims 1-4, the nonrotation cutting tool according to claim 5 is constituted so that R of one of the edge of a blade may be 0.03mm or less of abbreviation at least among said peripheral cutting edge or said end cutting edge.

[0011]

The gap from the geometric straight line of the peripheral cutting edge when a nonrotation cutting tool according to claim 6 is based on said shank for said peripheral cutting edge in a nonrotation cutting tool given in either of claims 1-5 is 3 micrometers or less, and said end cutting edge is constituted so that the gap from the geometry of the end cutting edge when being based on said shank may be 3 micrometers or less.

[Effect of the Invention]

[0012]

Among the front faces of a peripheral cutting edge or an end cutting edge, by carrying out coating of the diamond coat, when bending during cutting is controlled and it grinds a diamond coat, according to the nonrotation cutting tool according to claim 1, the granularity of either [at least] of the field of a diamond coat improves. Therefore, it is effective in the ability to obtain easily the nonrotation cutting tool with which sufficient process tolerance for finish-machining is acquired.

[0013]

By according to the nonrotation cutting tool according to claim 2, in addition to the effectiveness that a nonrotation cutting tool according to claim 1 does so, being used for processing of a scrolling type compressor and carrying out cutting advance of said nonrotation cutting tool Since an end cutting edge cuts a base while a peripheral cutting edge cuts the scrolling section, and there is no deflection by rotation, the effectiveness that process tolerance can be improved as compared with the case where it finish-machines with an end mill is acquired. Consequently, since the process tolerance of the scrolling section of a scrolling type compressor improves, whenever [between the scrolling sections / seal] increases, and the effectiveness that the compression efficiency of a scrolling type compressor improves is acquired.

[0014]

Moreover, according to the nonrotation cutting tool according to claim 2, it can finish with a nonrotation cutting tool according to claim 2 by roughing with an end mill. Therefore, in processing of the scrolling section by the end mill, as compared with the case of the former which had required three processes of roughing, semifinishing, and finishing, since a semifinishing process becomes unnecessary, it is effective in working efficiency improving.

[0015]

Furthermore, since the nonrotation cutting tool with which sufficient process tolerance for finish-machining of the scrolling section of a scrolling type compressor is acquired can manufacture easily as compared with the end mill for

finish-machining according to the nonrotation cutting tool according to claim 2, it is effective in being stabilized and being able to manufacture a scrolling type compressor.

[0016]

According to the nonrotation cutting tool according to claim 3, it adds to the effectiveness that a nonrotation cutting tool according to claim 2 does so. In finish-machining of a scrolling type compressor since it is constituted so that R of the corner which said peripheral cutting edge and said end cutting edge intersect may be 0.05mm or less of abbreviation. Whenever [seal / since R between the scrolling section and a base was processed in the almost same configuration as R of a tool configuration, when it inserts in the movable side scrolling section and the fixed side scrolling section] increases, and it is effective in the compression efficiency of a scrolling type compressor improving.

[0017]

Since according to the nonrotation cutting tool according to claim 4 it is constituted so that one of polished surface granularity may become either of claims 1-3 1.60micro below of abbreviation mRz at least among a peripheral cutting edge or an end cutting edge in addition to the effectiveness that the nonrotation cutting tool of a publication does so, it is effective in processing profile irregularity sufficient as finish-machining being acquired.

[0018]

Since according to the nonrotation cutting tool according to claim 5 it is constituted so that R of one of the edge of a blade may become 0.03mm or less of abbreviation at least among a peripheral cutting edge or an end cutting edge at either of claims 1-4 in addition to the effectiveness that the nonrotation cutting tool of a publication does so, it is effective in processing profile irregularity sufficient as finish-machining being acquired.

[0019]

According to the nonrotation cutting tool according to claim 6, it adds to the effectiveness that the nonrotation cutting tool of a publication does so to either of claims 1-5. The gap from the geometric straight line of the peripheral cutting edge when a peripheral cutting edge is based on said shank is 3 micrometers or less. And since the end cutting edge is constituted so that the gap from the geometry of the end cutting edge when being based on said shank may be set to 3 micrometers or less, it is effective in processing profile irregularity sufficient as finish-machining being acquired.

[Best Mode of Carrying Out the Invention]

[0020]

Hereafter, the desirable example of this invention is explained with reference to an accompanying drawing. Drawing 1 (a) is the front view of the nonrotation cutting tool 1, drawing 1 is drawing showing the nonrotation cutting tool 1 in the 1st example of this invention, and drawing 1 (c) is [drawing 1 (b) is the side elevation of the nonrotation cutting tool 1, and] the bottom view of the nonrotation cutting tool 1. First, with reference to drawing 1, the whole nonrotation cutting-tool 1 configuration is explained.

[0021]

the nonrotation cutting tool 1 -- the rake face -- a cutting travelling direction -- receiving -- abbreviation -- it is the so-called HALE tool made to carry out cutting advance relatively to *-ed material with the posture which becomes perpendicular, and the driving force of processing machines, such as a machining center, is transmitted through the electrode holder (not shown) holding the end (drawing 1 (a) right-hand side). The nonrotation cutting tool 1 is used suitable for the application which finish-machines for example, a scrolling type compressor (refer to drawing 7).

[0022]

The nonrotation cutting tool 1 is constituted by the cemented carbide which carried out pressure sintering of the tungsten carbide (WC) etc., and equips the end side (right-hand side of drawing 1 (a)) of the body 2 of a tool formed in a cross-section abbreviation hemisphere (refer to drawing 1 (c)), and its body 2 of a tool with the body 2 of a tool, and the shank 3 formed successively in one on the same axle. The nonrotation cutting tool 1 is attached in a processing machine by holding this shank 3 at an electrode holder.

[0023]

As shown in drawing 1 (a), the cutting part 4 is formed in the side-attachment-wall section (under drawing 1 (a)) and the bottom surface part (drawing 1 (a) left-hand side) of the body 2 of a tool. The cutting part 4 is equipped with the peripheral cutting edge 5 and the end cutting edge 6, and as these peripheral cutting edges 5 and an end cutting edge 6 are shown in drawing 1 (a), an abbreviation rectangular cross is carried out mutually and it is arranged. In addition, R of the corner which a peripheral cutting edge 5 and an end cutting edge 6 intersect is constituted so that it may become 0.05mm or less of radius abbreviation.

[0024]

While a cutting part 4 (a peripheral cutting edge 5, end cutting edge 6) coats the whole outside surface of the body 2 of a tool with a diamond coat by the thickness of 6 micrometers of abbreviation -, and 20 micrometers of abbreviation with a

CVD method, the rake face and flank are formed by grinding the diamond coat so that polished surface granularity may become 1.60micro below of abbreviation mRz using a grinding stone.

[0025]

It is because a diamond coat will peel and fall if having considered thickness of the diamond coat to coat as 6 micrometers of abbreviation - and 20 micrometers of abbreviation here has coating thickness thinner than 6 micrometers of abbreviation, and is because it is disadvantageous in respect of cost if it is 20 micrometers or more of abbreviation. In addition, the front face of a diamond coat may be ground using laser, an ion beam, thermochemistry-mechanical polish, mechanical-chemical polish, etc.

[0026]

A peripheral cutting edge 5 is a cutting edge formed in the side face of the body 2 of a tool so that the ridgeline of the rake face and flank may become abbreviation parallel to the shaft of a shank 3, and the flank is formed so that angle-of-relief alpha may become 5 degrees. Moreover, R of the edge of a blade is 0.03mm or less of radius abbreviation, and the peripheral cutting edge 5 is constituted so that the cylindricity of the peripheral cutting edge 5 on the basis of the gap 3 from the geometric straight line of the peripheral cutting edge 5 when being based on a shank 3, i.e., a shank, may serve as 3 micrometers or less of abbreviation.

[0027]

An end cutting edge 6 is a cutting edge formed in the base of the body 2 of a tool so that the ridgeline of the rake face and flank may become in the direction of a normal to the shaft of a shank 3, and the flank is formed so that angle-of-relief beta may become 5 degrees. Moreover, R of the edge of a blade is 0.03mm or less of radius abbreviation, and the end cutting edge 6 is constituted so that the straightness of the end cutting edge 6 when being based on the gap 3 from the geometric straight line of the end cutting edge 6 when being based on a shank 3, i.e., a shank, may serve as 3 micrometers or less of abbreviation.

[0028]

the field (rake face) in which the nonrotation cutting tool 1 constituted as mentioned above is formed of a peripheral cutting edge 5 and an end cutting edge 6 -- the sense of a cutting travelling direction -- receiving -- abbreviation -- cutting of the *-ed material is carried out by the peripheral cutting edge 5 and end cutting edge 6 by carrying out cutting advance relatively to *-ed material with the posture which becomes perpendicular. Drawing 7 is drawing showing the case where the nonrotation cutting tool 1 is used about processing of a scrolling type compressor. The scrolling section 102,105 and a base 101,104 are cut with the nonrotation cutting tool 1 fixed to the holder (not shown), specifically controlling the work table (not shown) which laid the fixed part 100 or moving part 103 of a scrolling type compressor to X shaft orientations, Y shaft orientations, and A shaft orientations that control rotation.

[0029]

Next, with reference to drawing 2 and drawing 3, the test result of the cutting trial performed using the nonrotation cutting tool 1 constituted as mentioned above is explained. This cutting trial is a trial which carries out cutting of the scrolling section 102,105 (refer to drawing 5) of a scrolling type compressor using the nonrotation cutting tool 1 and an end mill, and measures that process tolerance.

[0030]

Drawing 2 is the table showing the detail item of the nonrotation cutting tool 1 and end mill which are used for a cutting trial.

[0031]

The field granularity shown in drawing 2 means the field granularity in each peripheral cutting edge and end cutting edge of the nonrotation cutting tool 1 and an end mill here. The corner R means the corner R which each peripheral cutting edge and end cutting edge intersect about the nonrotation cutting tool 1 and the end mill. A straightness Meaning the straightness of the gap from the geometry of the end cutting edge when being based on each shank, i.e., an end cutting edge, about the nonrotation cutting tool 1 and an end mill, R of the edge of a blade means the edge of a blade R of each peripheral cutting edge and end cutting edge (radius) about the nonrotation cutting tool 1 and the end mill.

[0032]

Moreover, the cutting trial was performed by the cutting conditions shown below using the nonrotation cutting tool 1 and end mill which are shown in drawing 2.

[0033]

(Cutting conditions)

** [-ed] material: ADC12

The machine used: Horizontal-type machining center

Holder: Collet type mealing chuck

Cutting oil: Water-soluble-cutting-oil agent

[0034]

Drawing 3 is the table showing the result of a cutting trial, and surface roughness means the straightness [as opposed to / in a straightness / surface roughness / of *-ed material / corner R / the base of the scrolling section of *-ed material for the corner R between the scrolling section of *-ed material, and a base], respectively.

[0035]

According to the nonrotation cutting tool 1 with which this invention was applied, it was checked that cutting of the straightness to the base of the surface roughness of *-ed material, the corner R of the scrolling section of *-ed material and a base, and the scrolling section of *-ed material can be carried out with the outstanding process tolerance as compared with the case where it is based on an end mill so that clearly from the test result of drawing 3 .

[0036]

As shown in drawing 3 , when an end mill is specifically used to the appearance precision (referring to drawing 2) of the cutting part 4 being imprinted as it is by the processing side of *-ed material when the nonrotation cutting tool 1 is used, the processing side (corner R, straightness) precision of *-ed material is getting worse rather than the appearance precision (refer to drawing 2) of a cutting part. This is considered to originate in the deflection of the end mill by the rotation at the time of cutting, and a holder, bending, etc.

[0037]

As explained above, since the rigidity is secured by carrying out coating of the hard diamond coat to the front face of a peripheral cutting edge 5 and an end cutting edge 6, when it is controlled that a peripheral cutting edge 5 and an end cutting edge 6 bend during cutting and the nonrotation cutting tool 1 grinds a diamond coat, improvement in the granularity of the field is achieved. Therefore, the nonrotation cutting tool with which sufficient process tolerance for finish-machining is acquired can be obtained easily.

[0038]

Moreover, since an end cutting edge 6 cuts a base 101,104 while a peripheral cutting edge 5 cuts the scrolling section 102,105 by carrying out cutting advance of the nonrotation cutting tool 1 when using the nonrotation cutting tool 1 for processing of a scrolling type compressor, and there is no deflection by rotation, process tolerance can be improved as compared with the case where it finish-machines with an end mill. Consequently, since the process tolerance of the scrolling section of a scrolling type compressor improves, whenever [between the scrolling sections / seal] increases, and the compression efficiency of a scrolling type compressor improves.

[0039]

Moreover, according to the nonrotation cutting tool 1, since sufficient process tolerance is acquired, it can finish with the nonrotation cutting tool 1 by an end mill performing roughing.

[0040]

Furthermore, since the nonrotation cutting tool 1 can be easily manufactured as compared with the end mill for finish-machining of the scrolling section of a scrolling type compressor, it is stabilized and can manufacture a scrolling type compressor.

[0041]

Moreover, since it is constituted so that the corner R which a peripheral cutting edge 5 and an end cutting edge 6 intersect may be 0.05mm or less of abbreviation and the corner R between the scrolling section 102,105 and a base 101,104 is processed in the almost same configuration as R of a tool configuration when the nonrotation cutting tool 1 is used for finish-machining of a scrolling type compressor, whenever [seal / when inserting in the movable side scrolling section and the fixed side scrolling section] increases, and the compression efficiency of a scrolling type compressor improves.

[0042]

Moreover, since it is constituted so that the polished surface granularity of a peripheral cutting edge 5 and an end cutting edge 6 may become 1.60micro below of abbreviation mRz, respectively, processing profile irregularity sufficient as finish-machining is acquired.

[0043]

Moreover, since it is constituted so that the edge of a blade R of a peripheral cutting edge 5 and an end cutting edge 6 may serve as 0.03mm or less of abbreviation, respectively, processing profile irregularity sufficient as finish-machining is acquired.

[0044]

Moreover, the gap from the geometric straight line of the peripheral cutting edge 5 when a peripheral cutting edge 5 is based on a shank 3 is 3 micrometers or less, and since the end cutting edge 6 is constituted so that the gap from the

geometry of the end cutting edge 6 when being based on a shank 3 may be set to 3 micrometers or less, processing profile irregularity sufficient as finish-machining is acquired.

[0045]

Next, the 2nd example is explained with reference to drawing 4 (a). With the nonrotation cutting tool 1 of the 1st example, to the end cutting edge 6 having been constituted in the shape of a straight line, an end cutting edge 26 curves to an approximate circle arc, and is constituted from a nonrotation cutting tool 20 of the 2nd example. In addition, the same sign is given to the same part as the 1st above mentioned example, and the explanation is omitted.

[0046]

Drawing 4 (a) is the front view of the nonrotation cutting tool 20 in the 2nd example, and the shank 3 is omitted. As the nonrotation cutting tool 20 in the 2nd example is shown in drawing 4 (a), when the base side (on drawing 4 (a)) of the body 22 of a tool curves to an approximate circle arc, is constituted and grinds the diamond coat by which coating was carried out to the outside surface like the 1st example, the peripheral cutting edge 5 and the end cutting edge 26 are formed.

[0047]

According to this nonrotation cutting tool 20, in order to acquire the same operation effectiveness substantially with the nonrotation cutting tool 1 in the 1st example, for example, to perform recessing to *-ed material, it is used suitably. That is, according to the nonrotation cutting tool 20, a base can carry out cutting of the slot incurvated smoothly. Moreover, since according to this nonrotation cutting tool 20 the body 22 of a tool is made into the configuration corresponding to the shape of a quirk of the request processed beforehand and it considers as the configuration which coats and grinds a diamond coat after that, the configuration of a cutting part 24 can be fabricated easily.

[0048]

Next, the 3rd example is explained with reference to drawing 4 (b). The end cutting edge 36 is constituted from the nonrotation cutting tool 30 of the 3rd example toward the method of outside by the nonrotation cutting tool 1 of the 1st example to the end cutting edge 6 having been constituted in the shape of flatness in the shape of [of a convex] abbreviation a taper for V characters. In addition, the same sign is given to the same part as said 1st example, and the explanation is omitted.

[0049]

Drawing 4 (b) is the front view of the nonrotation cutting tool 30 in the 3rd example, and the shank 3 is omitted. As the nonrotation cutting tool 30 in the 3rd example is shown in drawing 4 (b), the peripheral cutting edge 5 and the end cutting edge 36 are formed by constituting the base side (on drawing 4 (b)) of the body 32 of a tool toward the method of outside in the shape of [of a convex] abbreviation a taper for V characters, and grinding the diamond coat by which coating was carried out to the outside surface like the 1st example.

[0050]

According to this nonrotation cutting tool 30, the same operation effectiveness is substantially acquired with the nonrotation cutting tool 30 in the 1st example, for example, a cross-section configuration can carry out cutting of the slot of the letter of the abbreviation for V characters to *-ed material. Moreover, according to this nonrotation cutting tool 30, the body 32 of a tool is made into the configuration corresponding to the shape of a quirk of the request processed beforehand, and since it considers as the configuration which coats and grinds a diamond coat after that, the configuration of a cutting part 34 can be fabricated easily.

[0051]

As mentioned above, although this invention was explained based on the example, this invention is not the object limited to the above-mentioned example in any way, and it can be guessed easily that amelioration deformation various by within the limits which does not deviate from the meaning of this invention is possible.

[0052]

For example, in the above-mentioned example, although the peripheral cutting edge 5 was formed only in one place of the side-attachment-wall section of a body 2, it may be formed in two places of the both sides (namely, both sides of a rake face) of the side-attachment-wall section of a body 2.

[0053]

In addition, although especially each above-mentioned example did not explain, the nonrotation cutting tools 1, 20, and 30 are recyclable by the approach shown below. Namely, by the cutting parts 4, 24, and 34 being constituted by the diamond coat side (polished surface), since the nonrotation cutting tools 1, 20, and 30 are things By coating a diamond coat again and grinding it, after burning in a furnace the nonrotation cutting tools 1, 20, and 30 with which the life was exhausted and removing a diamond coat Cutting parts 4, 24, and 34 can be reproduced and recycle of the nonrotation cutting tools 1, 20, and 30 is realized at cheap cost.

[Brief Description of the Drawings]

[0054]

[Drawing 1] (a) is a front view, it is drawing showing the nonrotation cutting tool in the 1st example of this invention, and (c) is [(b) is a side elevation and] a bottom view.

[Drawing 2] It is the table showing the detail item of the nonrotation cutting tool and end mill which are used for a cutting trial.

[Drawing 3] It is the table showing the result of a cutting trial.

[Drawing 4] (a) is the front view of the nonrotation cutting tool in the 2nd example of this invention, and (b) is the front view of the nonrotation cutting tool in the 3rd example of this invention.

[Drawing 5] It is drawing showing the scrolling type compressor which is ** -ed material, and (a) is the perspective view of a fixed part and (b) is the perspective view of moving part.

[Drawing 6] It is drawing explaining compression actuation of the gas by the scrolling type compressor.

[Drawing 7] It is drawing showing the case where a nonrotation cutting tool is used about processing of a scrolling type compressor.

[Description of Notations]

[0055]

1, 20, 30 Nonrotation cutting tool (HALE tool)

2, 22, 32 Body of a tool (body)

3 Shank

5 Peripheral Cutting Edge

6, 26, 36 End cutting edge

100 Fixed Part (Scrolling Type Compressor)

103 Moving Part (Scrolling Type Compressor)

101 104 Base

102 105 Scrolling section

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

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[Drawing 7] It is drawing showing the case where a nonrotation cutting tool is used about processing of a scrolling type compressor.

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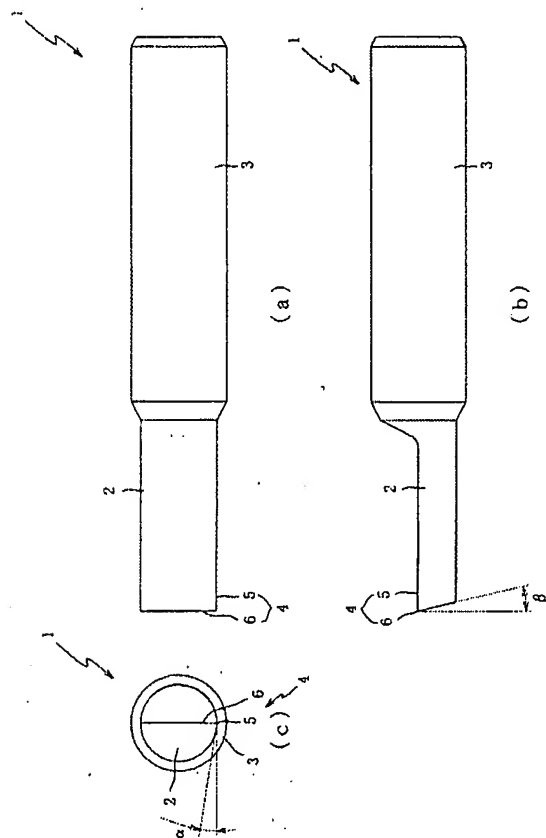
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DRAWINGS

[Drawing 1]



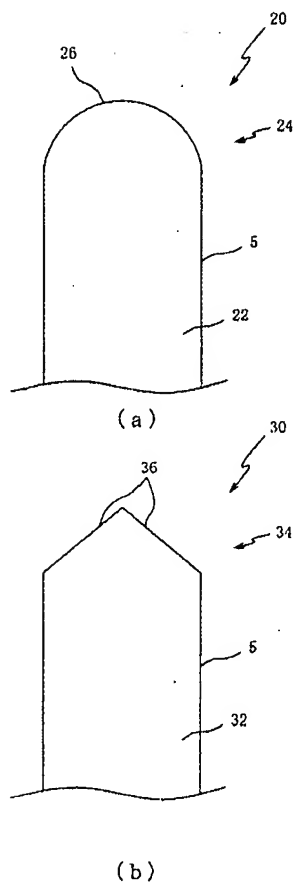
[Drawing 2]

	非回転切削工具	エンドミル
シャンク径	10mm	10mm
刃径	8mm	8mm
刃数	1	8
刃長	15mm	18mm
母材	K10	K10
被膜	ダイヤモンド+研磨	ダイヤモンド
回転速度	停止固定	20000min ⁻¹
送り速度	6000mm/min	6000mm/min
切込量	0.01mm	0.01mm
面粗さ	0.4 μ mRz	2.0 μ mRz
コーナR	0.03mm	0.03mm
真直度	0.9 μ m	2 μ m
刃先R	0.01 μ m	0.04 μ m

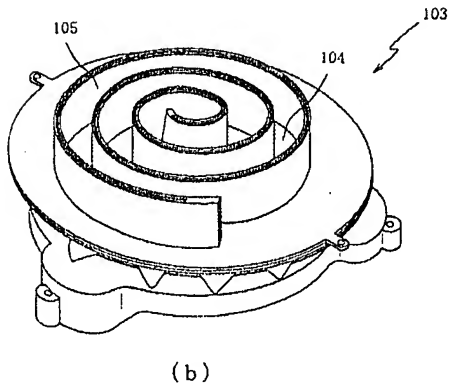
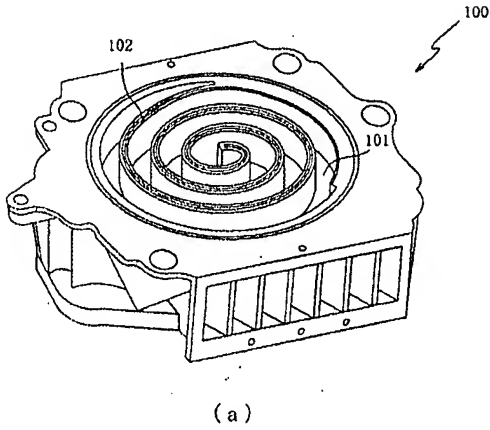
[Drawing 3]

	非回転切削工具	エンドミル
加工面粗さ	0.4 μ mRz	2.0 μ mRz
コーナR	0.03mm	0.05mm
真直度	0.9 μ m	4.9 μ m

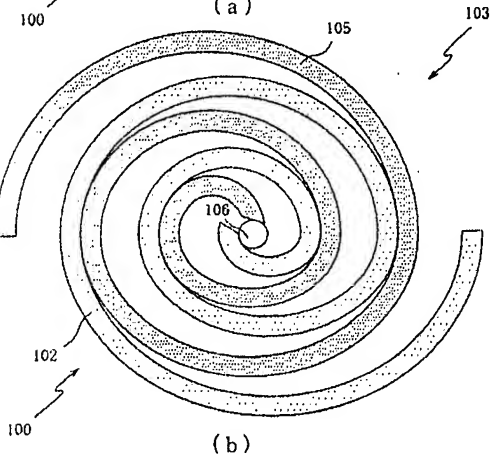
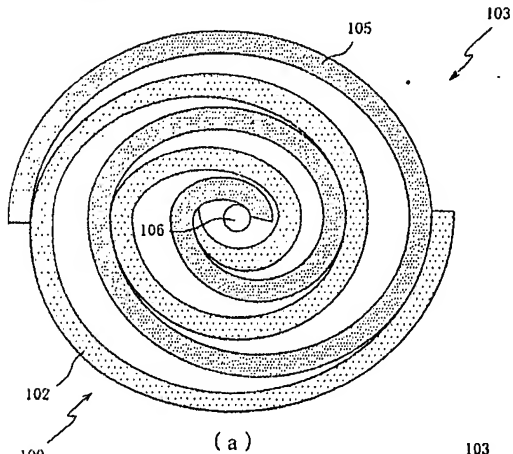
[Drawing 4]



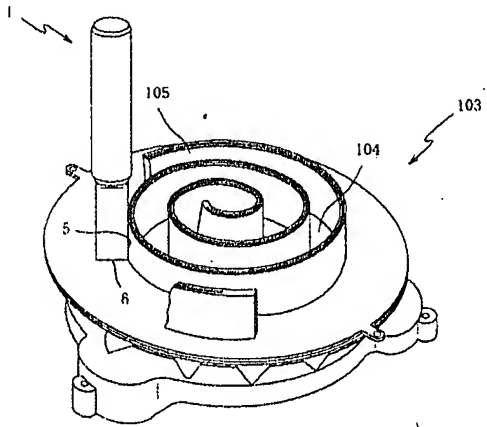
[Drawing 5]



[Drawing 6]



[Drawing 7]



[Translation done.]